

PANKRATOVA, G.F.; POLUBOYARINOV, D.N.; ZAYONTS, R.M.

Cordierite ceramics are heat-resistant refractory materials. Огнеупоры
25 no.2:73-76 '60. (MIRA 13:10)
(Cordierite) (Refractory materials)

KALLIGA, G.P.; KOLBASOVA, V.A.; POLUBOYARINOV, D.N.

Using calcium zirconate as a stabilizer in manufacturing zirconia products. Ogneupory 25 no.7:324-329 '60. (MIRA 13:8)

1. Khimiko-tekhnologicheskii institut im. Mendeleeva.
(Refractory materials)

KOPEL'KIN, V.A.; POLINOZALINOV, D.N.

Phase composition of ceramics having a high alumina content.
Ogneupory 25 no.12:566-572 '60. (MIRA 14:1)

1. Khimiko-tekhnologicheskii institut im. Mendeleeva.
(Ceramics)

POLUBOYARINOV, D.N.; POPIL'SKIY, R.Ya.; TSZYAN DUN-KHUA [Chiang Tung-hua]

Effect of the preliminary thermal processing and vibrogrinding
of magnesium oxide on its degree of dispersion, hydration, and
caking. Ogneupory 26 no. 2:80-86 '61. (MIRA 14:2)
(Magnesium oxide)

15.2000

1454, 1153, 1155

89691

S/131/61/000/003/001/001
B105/B206

AUTHORS: Vinogradova, L. V., Makarova, T. S., Rutman, D. S.,
Poluboyarinov, D. N., Popil'skiy, R. Ya., Serova, G. A.

TITLE: Manufacture of sintered ceramics from magnesium oxide

PERIODICAL: Ogneupory, ²⁶no. 3, 1961, 123-124

TEXT: This article describes the process of manufacturing thin-walled, sintered crucibles and shield tubes for thermocouples from magnesium oxide. This process was elaborated at the Podol'skiy zavod ogneupornykh izdeliy (Podol'sk Plant for Refractories) jointly with the kafedra keramiki (Department of Ceramics) of the Khimiko-tekhnologicheskii institut im. Mendeleyeva (Institute of Chemical Technology imeni Mendeleyev). The crucibles are intended for metal smelting. The initial material was commercial magnesium oxide with a content of ~98% MgO, the preparation of which (firing temperature and mode of crushing) was worked out according to previous studies. Commercial magnesium in powdery form is first fired in molds at 1300°C and then finely ground in a vibrating mill by means of steel balls. The powder was plasticized by

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Manufacture of sintered ceramics ...

means of paraffin with an addition of oleic acid. The shaping of crucibles and shield tubes for thermocouples from magnesium oxide by the "freezing-on" method permits the manufacture of products with a wall thickness of 5-0.3 mm. After partial burning out of the paraffin at a temperature of about 200°C, the products were fired in a regenerative medium (H₂) at 1700°C in an electric furnace with a molybdenum coil.

The firing time was 5 to 6 hr (2 hr in the high-temperature zone). After sintering, the average weight by volume of the products was 3.36 to 3.38 g/cm³, and their apparent porosity 0 to 0.4%; the white products showed good translucence. Pyrometric ceramics produced from magnesium oxide in the form of shield tubes for thermocouples and capillary tubes, permits temperature measurement up to more than 2000°C. The relatively simple process permits the manufacture of products for use at high temperatures, the waste being very small. There are 1 figure and 1 Soviet-bloc reference.

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89691

Manufacture of sintered ceramics ...

S/131/61/000/003/001/001
B105/B206

ASSOCIATION: Podol'skiy zavod огнеупорных изделий (Podol'sk Plant for Refractories) Vinogradova, L. V., Makarova, T. S., Rutman, D. S.; Khimiko-tekhnologicheskii institut im. Mendeleyeva (Institute of Chemical Technology imeni Mendeleyev) Poluboyarinov, D. N., Popil'skiy, R. Ya., Serova, G. A.

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POLUBOYARINOV, D.N.; ADUSHKIN, L.Ye.; GUZMAN, I.Ya.; ZAYONTS, R.M.

Some properties of porous cordierite ceramic. Ogneupory. 26
no.8:370-372 '61. (MIRA 14:9)

1. Khimiko-tekhnologicheskii institut im. Mendeleeva (for
Poluboyarinov, Adushkin, Guzman). 2. Nauchno-issledovatel'skiy
institut stroitel'noy keramiki (for Zayonts).
(Cordierite) (Refractory materials)

TROSTYANSKAYA, Ye.B.; SHISEKIN, V.A.; SIL'VESTROVICH, S.I.; PANTELEYEV,
A.S.; POLUBOYARINOV, D.N.; BALKEVICH, V.L.; NATANSON, A.K.;
KOLACHEV, B.A.; PETROV, D.A.; GOL'DBERG, M.M.; SHAROV, M.Ya.,
inzh., retsenzent; KITAYGORODSKIY, I.I., doktor tekhn. nauk,
prof., retsenzent; LIVANOV, V.A., kand. tekhn. nauk, prof.,
retsenzent; TROSTIANSKAYA, Ye.B., red.; BABUSHKINA, S., ved.
red.; TITSKAYA, B.F., ved. red.; VORONOVA, V.V., tekhn. red.

[New kinds of materials in engineering and industry] Novye ma-
terialy v tekhnike. Pod red. Trostianskoi E.B., Kolacheva,
B.A., Sil'vestrovicha S.I. Moskva, Gostoptekhhizdat, 1962.
656 p. (MIRA 16:2)

(Materials)

Poluboyarinov, D.N.

PHASE I BOOK EXPLOITATION

SOV/6202

Budnikov, P. P., Academician, Academy of Sciences UkrSSR, Corresponding Member, Academy of Sciences USSR, A. S. Berezhnuy, I. A. Bulavin, G. P. Kalliga, G. V. Kukolev, and D. N. Poluboyarinov

Tekhnologiya keramiki i ogneporov (Technology of Ceramics and Refractory Materials). 3d ed., rev. and enl. Moscow, Gosstroyizdat, 1962. 707 p. Errata slip inserted. 15,000 copies printed.

Ed. (Title page): P. P. Budnikov; Ed. of Publishing House: N. A. Gomozova; Tech. Ed.: G. D. Naumova.

PURPOSE: This book is a textbook intended for students taking courses in the technology of silicates at institutions of higher education.

COVERAGE: The book describes the physicochemical and mechanical properties of various ceramic and refractory products, including cermets, pure refractory oxides, glazes, aramic pigments, porcelain, and faience. The raw materials and methods of manufacturing ceramic

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Technology of Ceramics and Refractory Materials

and refractory products are reviewed. There are 167 references, mostly Soviet.

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PART I. STRUCTURAL CERAMICS

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3266h
S/131/62/000/001/001/002
B105/B110

15 2230
21.2110
AUTHORS:

Kalliga, G. P., Kolbasova, V. A., Poluboyarinov, D. N.

TITLE:

Peculiarities of the casting technology for zirconium products

PERIODICAL: Ogneupory, no. 1, 1962, 28-34

TEXT: An investigation conducted jointly with the Podol'skiy zavod ogneupornykh izdeliy (Podol'sk Plant of Refractory Products) dealt with the following processes: (1) Dressing of the raw material, (2) its acid treatment and the casting process in various media. Experiments were conducted with zirconium dioxide (97.55% ZrO_2 , 1.15% TiO_2) which was stabilized by admixture of 6% CaO. Industrial ZrO_2 and $CaCO_3$ were used as initial materials. Zirconium dioxide was ground, washed with HCl, and brought to pH = 3 with water. $CaCO_3$ was ground in a corundum mill. Briquettes were molded from these materials at 500 kg/cm², and fired at 1750°C. Two types of initial dross were used: alkaline with pH = 10.5 and acid with pH = 1.5-1.7. The casting properties of alkaline and acid dross were determined. L. G. Markaryan, V. I. Markaryan, L. M. Privina,

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15.2230

S/131/62/000/004/001/002
B105/B101

AUTHORS: Poluboyarinov, D. N., Popil'skiy, R. Ya., Chiang Tung-hua

TITLE: Effect of some admixtures on sintering and properties of highly refractory periclase ceramics

PERIODICAL: ²⁷Ogneupory, no. 4, 1962, 178 - 184

TEXT: The effect of a number of admixtures on sintering, microstructure and some properties of periclase ceramics on the basis of various types of initial magnesium oxide was studied. Attention was chiefly devoted to the heat-resistance increase of sintered periclase ceramics. The effect of admixtures was studied for two initial materials: (1) magnesium oxide, burned at 1300°C and ground for 60 min; (2) molten magnesium oxide, ground for 60 min. TiO_2 and Fe_2O_3 (0.5, 1, 2 and 4%) as well as Al_2O_3 and ZrO_2 (1, 2, 4 and 8%) were used as admixtures. Admixtures of commercial alumina of the type Γ -O (G-O), burned at 1450°C, as well as unstabilized commercial zirconium dioxide (98% ZrO_2 + HfO_2), burned at 1700°C, were introduced in amounts of 1, 2, 4 and 8%. The admixtures were dry-ground with magnesium

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B105/B101

Effect of some ...

oxide on the vibration mill of the type M-10 (M-10) for 1 hr. The samples were plasticized with water, pressed and burned in a kerosene furnace at 1400, 1500, 1600, 1700 and 1750°C for 2 hr. X-ray and petrographic analyses showed that new formations in the mass of pure magnesium oxide with admixtures of 8% Al_2O_3 represent spinel ($MgO \cdot Al_2O_3$). The following was tested: bending strength, modulus of elasticity, volume weight, dimensions of periclase crystals, and linear thermal expansion coefficient (α). Results: (1) The two types of MgO produced almost identical results; (2) TiO_2 , Fe_2O_3 and Al_2O_3 lower sintering temperature, bending strength and modulus of elasticity; (3) best admixtures for the purpose of lowering the sintering temperature are 2.4% for TiO_2 and Fe_2O_3 ; 4% for Al_2O_3 ; (4) ZrO_2 admixture (4%) had a useful effect only with molten MgO ; (5) up to $\approx 1950^\circ C$, no deformation set in below 2 kg/cm²; (6) effect of admixtures on α was negligible; (7) enlargement of the periclase crystals and increased heat resistance occurred especially in the case of Al_2O_3 admixture. The production of sintered periclase ceramics of increased heat resistance with admixtures of 4-8% Al_2O_3 , which simultaneously lower the sintering

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Effect of some ...

S/131/62/000/004/001/002
B105/B101

temperature without reducing the refractory properties of the material, is considered to be of interest. There are 4 figures and 3 tables.

ASSOCIATION: Khimiko-tekhnologicheskii institut im. Mendeleyeva (Institute of Chemical Technology imeni Mendeleyev)

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X

37239
S/131/62/000/005/004/004
B105/B138

15.2230
AUTHORS:

Poluboyarino¹¹, D. N., Lukin, Ye. S.

TITLE:

Heat resistance of corundum refractories

PERIODICAL:

Ogneupory, no. 5, 1962, 230-235

TEXT: The paper reports on the heat resistance and softening point under load of corundum refractories at temperatures above 1700°C. 30-50% finely disperse alumina with kaolin was used as binding agent. The specimens for determining the most important thermomechanical properties were prepared by injection molding from a mass calcined at 400°C and plasticized with 10% paraffin. With an Al_2O_3 excess, a solid solution of corundum crystallizes in mullite with the composition $2Al_2O_3 \cdot SiO_2$.

A method was devised for determining the heat resistance on the basis of the temperature gradient causing cracks in the specimen. The specimens were hollow cylinders, heated from inside, cooled from outside. Temperatures of the inner and outer walls of the cylinders were measured. The total phase composition of this mixture is 44% mullite, 46% corundum,

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Heat resistance of corundum ...

and 10% vitreous phase. Qualitative X-ray structural analysis was carried out on an YPC-50M (URS-50I) apparatus. Refractories on the basis of electrically fused corundum with alumina as a binder have comparatively low resistance to heat. The softening point of this material under a load of 2 kg/cm^2 is above 1800°C . Heat resistance may be increased by replacing the alumina binder by 10-20% kaolin, but the softening point then drops to 1700°C . Substitution of finely disperse alumina for the fine-grained electrically fused corundum causes active crystallization of mullite and a further increase in heat resistance. The softening point then remains at 1670°C . There are 1 figure and 3 tables. The English-language references read as follows: W. R. Buessem, E. A. Bush, Journ. Amer. Cer. Soc., No.1, 1955; Y. White, Trans. Brit. Cer. Soc., No.10, 1958.

ASSOCIATION: Khimiko-tekhnologicheskii institut im. Mendeleyeva
(Institute of Chemical Technology imeni Mendeleyev)

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GUZMAN, I.Ya.; POLUBOYARINOV, D.N.; Prinimali uchastiye: KOMISSAROVA,
N.M.; MOROZOVA, V.S.

Some properties of porous ceramics made of beryllium oxide.
Ogneupory 27 no.10:457-462 '62. (MIRA 15:9)

1. Khimiko-tehnologicheskii institut im. Mendeleyeva.
(Refractory materials) (Beryllium oxide)

POLUBOYARINOV, D.N.; RUTMAN, D.S.

Creative cooperation between workers in science and in
production. Ogneupory 27 no.11:501-503 '62. (MIRA 15:11)

1. Khimiko-tekhnologicheskii institut im. Mendeleyeva
(for Poluboyarinov). 2. Podol'skiy zavod ogneupornykh
izdeliy (for Rutman).

(Refractory materials--Research)

S/063/63/008/002/005/015
A057/A126AUTHORS: Poluboyarinov, D.N., Professor, Shal'nov, Ye.I.

TITLE: Hot-pressing of pure oxide ceramics

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D.I. Mendele-
yeva, v. 8, no. 2, 1963, 148 - 154

TEXT: The method of hot-pressing of the oxides BeO , MgO , CaO , Al_2O_3 , is discussed and two devices for pressing are described. The discussion is based on literature data, except some results on Al_2O_3 microstructures obtained through investigations in the Kafedra tekhnologii keramiki i ogneporov MKhTI im. D.I. Mendeleeva (Department of Technology of Ceramics and Refractory Materials MKhTI imeni D.I. Mendeleev). The described method is used to obtain articles with higher density, i.e., sintering is intensified by applying pressure. The density of articles manufactured by the hot-pressing of beryllium oxide attains 2.9 g/cm^3 . It was determined that normal sintering occurs principally by a diffusion process, while in hot-pressing by plastic flow. Investigations of the growth of the grain during hot pressing are important for the knowledge of the

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Hot-pressing of pure oxide ceramics

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properties of the manufactured articles, but also for studies of the mechanism of sintering. The size of BeO crystals is effected by admixtures, i.e., more fine-grained materials are obtained with admixtures. The surface activity of particles effecting the sintering degree of MgO depends on the hot-pressing of MgCO_3 which forms the fine-crystalline oxide powder by decomposition. For the hot-pressing of CaO also carbonate is used as initial material and a secondary calcination of the CaO is carried out at $1,700^\circ\text{C}$ after aging, and a 2.88 g/cm^3 density is attained. At the Department of Technology of Ceramics and Refractory Materials they investigated the sintering of some different forms of alumina (hydrate, technical-grade alumina Al_2O_3 , corundum monocrystals, and alumo-ammonia alums) in vacuum and observed no increase of density even at a sintering temperature of $2,000^\circ\text{C}$. Hot-pressing was studied with samples of industrial grade Al_2O_3 at pressures of $51 - 127\text{ kg/cm}^2$ and $1,200 - 1,700^\circ\text{C}$ with $10 - 30$ min holding time. The experimentally obtained densities were in good agreement with the calculated values. In the same laboratory the hot-pressing of the mentioned different forms of alumina was then investigated. A special device was constructed (containing a 15 kw high-frequency generator, a system for the transfer of the pressure, a vacuum system - 10^{-5} torr - and a system for filling with inert

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Hot-pressing of pure oxide ceramics

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gas). The investigated material was pressed in forms of 15 mm diameter, 5 mm height in an inert gas at 1,500, 1,600, 1,700, and 1,800°C with holding times of 10, 20, 30, and 60 min, and specific pressure of 500 kg/cm². The following results were obtained: The relative density of 3.96 g/cm³ was attained at 1,600°C in 30 min and for corundum at 1,700°C. In none of the samples could be attained a relative specific density above 0.97 by hot-pressing at 1,500°C during 60 min. The difference of density between the various alumina samples decreases with increasing temperature. The obtained samples showed a fine-grained crystalline structure (sintered at 1,600°C the grain size is below 1 μ, at 1,700°C 2 - 3 μ, and at 1,800°C single grains with 250 - 300 μ were observed among 1 - 3 μ ones. There are 10 figures and 6 tables.

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S/131/63/000/004/001/001
A006/A101AUTHORS: Poluboyarinov, D.B., Kalliga, G.P., Lyutsareva, L.A.

TITLE: On the problem of stabilizing and sintering high-purity zirconium dioxide

PERIODICAL: Ogneupory, ²⁸no. 4, 1963, 175 - 179

TEXT: The material investigated was zirconium oxide containing 99.5% basic oxide, 0.1% HfO_2 and 0.4% other admixtures. MgO and CaO were used for stabilization; to reveal the effect of the type of anion, CaF_2 was employed. Twelve types of experimental substances were prepared with a gradually increasing content (from 4 to 15 mol%) of the stabilizing agent. Specimens were prepared by semi-dry pressing under 450 kg/cm^2 pressure. The moisture of the pressed powders was 6%. The dried specimens were annealed at $1,710^\circ\text{C}$ with 5 h holding and slowly cooled down. The following results are obtained. Under conditions of oxidizing annealing at $1,710^\circ\text{C}$ during 5 h, substances with 10 mol% of stabilizing oxide are fully sintered. Stabilization is sufficient and the material acquires high strength and heat resistance as compared with other investigated substances. If

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On the problem of stabilizing and sintering

S/131/63/000/004/001/001
A006/A101

the amount of the stabilizing agent is increased to 12 - 15% a well-sintered and fully stabilized product is obtained; however, the density of the material is reduced which appears particularly when CaO is added. Moreover, the strength and heat-resistance are sharply reduced. The relatively low density of an annealed substance with 10 mol% of a stabilizing admixture (for CaO 5.20 and for MgO 5.28 g/cm³), is mainly determined by the presence of pores, both inside and on the boundaries of the material crystals. A rise of the annealing temperature to 2,200°C has only a slight effect on the material density. A higher density of a material with 10 mol% CaO is attained - a) by changing the type of anion introduced together with the stabilizer CO₃²⁻ to F⁻; the heat-resistance of the material is then strongly impaired; b) by preliminary sintering of the stabilized product; as a result specimens of 5.54 g/cm³ volumetric weight are obtained. There are 3 tables and 5 figures.

ASSOCIATION: Khimiko-tekhnologicheskii institut im. D.I. Mendeleeva (Chemical and Technological Institute imeni D.I. Mendeleev)

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L 18513-63
AFFTC/ASD/ESD-3/SSD
ACCESSION NR: AP3000027

EPR/EWT(d)/EFF(c)/EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2 AEDC/
Ps-l/Pr-l/In-l WW/JD/WH/JG
S/0131/63/000/005/0232/0234

AUTHORS: Vlasov, A. S.; Poluboyarinov, D. N.

TITLE: Cermets made of chromium and aluminum oxide by using exothermal reaction

SOURCE: Ogneupory, no. 5, 1963, 232-234

TOPIC TAGS: cermet, thermite reaction, Cr_2O_3 , Al_2O_3 , corundum, physical property, thermal stability

ABSTRACT: This report is a summary of cermet properties, and a discussion of possible improvement in stability characteristics of chromium-corundum cermets by the use of the thermite reaction. The thermite reaction $Cr_2O_3 + 2Al = 2Cr + Al_2O_3 + Q$ is initiated in an electric furnace by heating to 875C a mixture of metallic chromium and corundum, held in a corundum container. Thereafter the reaction continues spontaneously and produces material containing 50.2% Cr and 49.8% Al_2O_3 . To obtain the composition of 30% Cr and 70% Al_2O_3 , corundum may be added to the mixture either before the reaction (for cermet K-1) or after the reaction (for K-2). The control batch (K-0) consists of 30% metallic Cr and 70% clay alumina. In general, the properties of cermets K-1 and K-2 are better than those of K-0 and their somewhat lower thermal stability will probably be improved in the future. Orig. art. has: 1 table and 3 photographs.

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L 18513-63

ACCESSION NR: AP3000027

ASSOCIATION: Khimiko-tekhnologicheskoy institut im. D. I. Mendeleeva (Chemical-
Technological Institute)

SUBMITTED: 00

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: ML

NO REF SOV: 002

OTHER: 003

Card 2/2

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EPF(n)-2/EMP(q)/EWT(m)/BDS/T-2/ES(s)-2 AFFTC/ASD/SSD

Pu-4/Pt-4 JD/WH

ACCESSION NR: AP3004263

S/0131/63/000/007/0318/0323

AUTHOR: Lukin, Ye. S.; Polubovarinov, D. N.

TITLE: Some thermal and mechanical properties of pure-oxide ceramics

SOURCE: Ogneupory*, no. 7, 1963, 318-323

TOPIC TAGS: pure-oxide ceramic, refractory oxide, aluminum oxide, zirconium oxide, magnesium oxide, beryllium oxide, alumina refractory, zirconia refractory, magnesia refractory, beryllia refractory, ceramic refractoriness-under-load, ceramic expansion coefficient, ceramic bending strength, ceramic compressive strength, ceramic thermal-shock resistance, high-temperature refractory, vacuum furnace

ABSTRACT: Refractoriness under a 2 kg/cm² load, coefficient of linear expansion (α), bending strength (σ_b), compressive strength, (σ_{comp}), and thermal-shock resistance have been determined in pure-oxide sintered refractories. Samples used on alumina (Al_2O_3), zirconia (ZrO_2), magnesia (MgO), and beryllia (BeO) are prepared from: 1) technical-grade Al_2O_3 fired at 1450C with additions of 1% TiO_2 or MnO_2 , 5% ZrO_2 , or 1% TiO_2 and 5% ZrO_2 ; 2) pure zirconia (99.5% ZrO_2) stabilized with 8, 10, or 12% CaO or MgO ; 3) technical-grade (97.5%) ZrO_2 stabilized with 5% CaO or MgO ; 4) technical-grade MgO ; and 5) chemically pure BeO fired at 1800C. All

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ACCESSION NR: AP3004263

the samples were compacted and fired at 1550—1950C to form 4 x 4 x 20 mm specimens. Refractoriness-under-load and α were determined in a vacuum furnace, which is described in detail in the article and shown in Fig. 1 of Enclosure. Sample temperature was measured with an optical pyrometer, and α , with a graphite dilatometer built into the furnace. The softening point under load was found to be: 1) in the 1860—1930C range for Al_2O_3 -base samples and 1900C for pure Al_2O_3 samples; 2) in the 2250—2300C range for pure ZrO_2 and about 2100C for technical-grade ZrO_2 -based samples; and 3) 2300C and 2450C for MgO and BeO samples, respectively. It is noted, however, that the figures for MgO and BeO may not be correct because of considerable vaporization in vacuum at their softening points. The average α values for the pure-oxide ceramics studied were generally in agreement with literature data. Linear expansion at 1800—2000C amounted to 2—3%. Both σ_{comp} and σ_b decline rapidly at 1600—1800C. The highest σ_b — at 1630C and 483—505 kg/cm² — was found for the pure- ZrO_2 -base samples stabilized with MgO. Among Al_2O_3 -base samples, those with 5% ZrO_2 have the highest σ_b (290 kg/cm² at 1630C) and σ_{comp} (300 kg/cm² at 1800C). MgO and BeO exhibited σ_{comp} at 1800C of 340 and 360 kg/cm², respectively, which are the highest of all the oxide ceramics, but their σ_b were low. BeO displayed the highest thermal-shock resistance of all the oxide ceramics studied, as evidenced by σ_b , which remained practically unchanged after one 1300C-air cycle and decreased by only 30% after one 850C-water cycle. Samples based on Al_2O_3 with 5% ZrO_2 and on

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ACCESSION NR: AP3004263

pure ZrO_2 with optimum CaO or MgO content showed the highest thermal-shock resistance of all Al_2O_3 - or ZrO_2 -base samples. Additions of 1% TiO_2 and 5% ZrO_2 to Al_2O_3 contributed to a decrease in sintering temperature combined with an increase in thermal-shock resistance. Orig. art. has: 3 figures and 6 tables.

ASSOCIATION: Khimiko-tekhnologicheskii institut im. D. I. Mendeleeva (Institute of Chemical Technology)

SUBMITTED: 00

DATE ACQ: 20Aug63

ENCL: 01

SUB CODE: MA

NO REF SOV: 004

OTHER: 006

Card 3/143

DUDEROV, I.G.; POLUBOYARINOV, D.N.

Effect of porosity and structure of corundum refractories.
on their heat conductivity. Ogneupory 28 no.11:518-524 '63.
(MIRA 16:12)

1. Khimiko-tekhnologicheskii institut im. D.I. Mendeleyeva.

ACCESSION NR: AP4013187

8/0131/64/000/002/0082/0089

AUTHOR: Poluboyarinov, D. N.; Bashkatov, V. A.; Serova, G. A.; Golubeva, Ye. V.; Shlemin, A. V.

TITLE: Testing of highly refractory insulation materials in lithium vapors at high temperatures in a vacuum

SOURCE: Ogneupory*,²⁹ no. 2, 1964, 82-89

TOPIC TAGS: insulation, insulation material, insulation material testing, lithium vapor, refractory insulation material, high temperature material testing, insulation material alkali metal resistance

ABSTRACT: In respect to the effect of alkali metals on refractory materials at high temperatures, tests have been conducted on the resistance of different materials to liquid lithium and ionized lithium vapors in a vacuum. Aluminum oxide, calcium oxide, magnesium oxide (pure and with Al_2O_3 admixtures), zirconium dioxide and certain other high-melting materials (zircon, calcium zirconate, silicon nitride, silicon carbide on a vitreous bond, silicon carbide on β -carborundum and silicon nitride bonds, as well as a material with a boron nitride base) served as base materials. Samples of corundum, zirconium dioxide, magnesium oxide, and cal-

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ACCESSION NR: AP4013187

cium oxide were prepared using G-O technical alumina (98.7% Al_2O_3), white electrosmelted corundum No. 36 and 280 (95.5% Al_2O_3), smelted technical ZrO_2 stabilized by calcium oxide (91.16% ZrO_2 , 6.49% CaO), monoclinic ZrO_2 (98.02% ZrO_2), technical magnesium oxide (98.7% MgO), and calcium carbonate. Samples were prepared in solid-sintered and granular-porous pieces. The basic results were: (1) corundum, zirconium dioxide, zircon, calcium zirconate, and silicon nitride were affected considerably by lithium, particularly in contact with melted lithium; (2) magnesium oxide and calcium oxide showed greater chemical stability; (3) the chemical stability of magnesium oxide with Al_2O_3 admixtures was noticeably less than that of pure magnesium oxide; (4) the carborundum samples on a bond of β -carborundum did not possess the required electroinsulating properties; (5) boron nitride-base samples showed chemical and thermal stability. It was concluded that refractory materials of pure aluminum oxide and pure zirconium dioxide, zircon, calcium zirconate and silicon nitride are not serviceable because of their low chemical stability; however, boron nitride, calcium oxide, and magnesium oxide may be used as insulators. Orig. art. has: 8 figures, 2 tables.

Card 2/3

ACCESSION NR: AP4013187

ASSOCIATION: Khimiko-tekhnologicheskii institut im. D. I. Mendeleeva (Institute of Chemical Technology)

SUBMITTED: 00

DATE ACQ: 02Mar64

ENCL: 00

SUB CODE: MA, CH

NO REF SOV: 002

OTHER: 003

Card 3/3

LUKIN, Ye.S.; POLUBOYARINOV, D.N.

Vaporization of ceramic materials from pure oxides at high temperatures.
Ogneupory 29 no.9:418-424 '64. (MIRA 17:10)

1. Khimiko-tekhnologicheskii institut im. D.I. Mendeleeva.

POLUEBYARINOV, D.N.; BAKUNOV, V.S.

Creep of ceramics made from pure aluminum and magnesium oxides
at high temperatures. Izv. AN SSSR. Neorg. mat. 1 no.3:374-
379 Mr '65. (MIRA 18:6)

1. Moskovskiy khimiko-tekhnologicheskii institut imeni
Mendeleeva.

POIUBOYARINOV, D.N.; DUDEROV, I.G.

Automatic unit for measuring the thermophysical coefficients
of ceramic materials. Zav. lab. 31 no.11:1410-1412 '65.
(MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskij institut imeni Mende-
leyeva.

L 23793-66 EWP(e)/EWT(m)/EWP(c) IJP(c) JD/JG/WH

ACC NR: AP6007257

(A)

SOURCE CODE: UR/0363/66/002/002/0336/0342

AUTHOR: Poluboyarinov, D.N.; Shapiro, Ye. Ya.; Bakunov, V.S.; Akopov, F.A.

ORG: Moscow Chemico-technological Institute im. D.I. Mendeleev
(Moskovskiy khimiko-tekhnologicheskii institut)

54
53

TITLE: Change in electric conductivity⁶ and rate of creep of sintered³
ceramic made of cerium dioxide during its reduction

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 2,
1966, 336-342

TOPIC TAGS: ceramic material, cerium compound, electric conductivity,
creep, powder metal sintering

ABSTRACT: The investigation was carried out on samples prepared from cerium dioxide with a content of the base component of 99.7%. The main impurities were oxides of the rare earth elements. The cerium dioxide was ground in a steel mill by the "wet" method for 30 hours with subsequent purification from iron. Samples for determination of the rate of creep were in the form of small beams, and for determination of the electric conductivity in the form of disks. Calcining was done in an oxidizing atmosphere at 1500°C. The electric conductivity was determined in air over the temperature interval from 20 to 1100°C. The

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Card 1/2

UDC: 666.3: 537. 315.2

L 23793-66

ACC NR: AP6007257

creep rate was determined in air and in an inert gas medium by measurement of the bending deformation of the sample with loading at four points. The experimental results are shown in a series of curves. It was found that during reduction, the properties of cerium dioxide ceramic change in a regular manner. The activation energy falls from 23 to 10 kcal/mole for electric conductivity, and from 92 to 39 kcal/mole for creep in the reduction of $\text{CeO}_{2.00}$ to $\text{CeO}_{1.90}$. The electric conductivity of CeO_2 is basically electronic. With reduction of CeO_2 to $\text{CeO}_{1.95}$ the mobility of the electrons increases by five orders of magnitude, and with further reduction to $\text{CeO}_{1.90}$ by another order of magnitude. Creep of stoichiometric CeO_2 is due to various factors but, according to the degree of reduction, the limiting factor is the process of diffusion of voids. The diffusion coefficient for the oxygen ion in the reduction of $\text{CeO}_{2.00}$ to $\text{CeO}_{1.90}$ changes by one order of magnitude. Orig. art. has:

7 figures and 1 table.

SUB CODE: 11,13,07/ SUBM DATE: 21Apr65/ ORIG REF: 005/ OTH REF: 006

Cord 2/2 ☒

ACC NR: AT6036942

sintering temperature of Nb is 1850C). However, the density and strength of cermets consisting of components with greatly different sintering of temperatures can be improved by additional alloying with nickel or zirconium or a combination of both. For instance, the porosity of W + Al₂O₃ cermet dropped from 24% to 5% as a result of addition of 1% Ni. Simultaneously, the bend strength increased from 800 kg/cm² to 3050 kg/cm². The W + Al₂O₃ + 1% Zr cermet had a porosity of 7.0% and a bend strength of 3500 kg/cm². The addition of 2% TiO₂ to CO + Al₂O₃ cermet decreased the porosity from 30% to 16% and increased the bend strength from 680 kg/cm² to 1490 kg/cm² and the notch toughness from 1.5 kg·cm/cm² to 1.75 kg·cm/cm². Orig. art. has: 1 table. [ND]

SUB CODE:: 11, 13/ SUBM DATE: 02Nov65/ ORIG REF: 005/ OTH REF: 003/
ATD PRESS: 5109

Card 2/2

1 06489.67 EWT(m)/EWP(e) WH

ACC NR: AP6028302

SOURCE CODE: UR/0363/66/002/006/1115/1118

AUTHOR: Poluboyarinov, D. N.; Popil'skiy, R. Ya.; Galkina, I. P.; Bakunov, V. S.

ORG: Moscow Chemical Engineering Institute im. D. I. Mendeleev (Moskovskiy khimiko-tekhnologicheskii institut)

TITLE: Creep of ceramic materials in the MgO-MgAl₂O₄ system

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 6, 1966, 1115-1118

TOPIC TAGS: creep mechanism, oxide ceramic, magnesium compound, aluminum compound

ABSTRACT: The mechanism of creep and deformation under load in the periclase-spinel system was studied. The creep rate was measured as a function of temperature and load, and the empirical creep law $\dot{\epsilon} = Se^{-Q/RT}n$ was found to hold, ϵ being the deformation rate, Q the activation energy, R the gas constant, T the temperature, and S and n empirical constants. The lowest creep rates were exhibited by spinel and periclase: when MgO admixtures are introduced into spinel and spinel admixtures into MgO, the creep rate increases, and in the range of 14-63 wt. % Al₂O₃ becomes equal to or greater than that of the pure components. The dependence of the deformation rate of the materials studied on the stress approximately obeys the law for viscous flow. The mechanisms of deformation under load at high temperatures and of creep at lower temperatures are similar. Orig. art. has: 5 figures and 2 tables.

Card 1/2

UDC: 546.46-31+546.46*623

L 06489-67

ACC NR: AP6028362

SUB CODE: 11,20/SUBM DATE: 21Apr65/ ORIG REF: 005/ OTH REF: 003

Card 2/2 *ME*

ACC NR: AT6036924

SOURCE CODE: UR/0000/66/000/000/0005/0020

AUTHORS: Poluboyarinov, D. N.; Lukin, Ye. S.

ORG: none

TITLE: A high-temperature investigation of some properties of pure oxide ceramics

SOURCE: Nauchno-tekhnicheskoye obshchestvo chornoy metallurgii. Moskovskoye pravleniye. Vysokoogneupornyye materialy (Highly refractory materials). Moscow, Izd-vo Metallurgiya, 1966, 5-20

TOPIC TAGS: oxide ceramic, high temperature ceramic material, ceramic product property

ABSTRACT: Thermomechanical properties of oxide ceramics containing from 0.3 to 0.5% (by weight) of impurities have been investigated. Materials used were: $3\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$, Al_2O_3 (I), $\text{MgO} \cdot \text{Al}_2\text{O}_3$ (II), BaO (III), CaO , ZrO_2 stabilized with MgO (IVa), ZrO_2 stabilized with CaO (IVb), and MgO (V). The properties studied at temperatures up to 2500C were: deformation under load of 2 kg/cm², mechanical strength, loss of weight, thermal expansion, and thermal stability. The method for determining these properties and the type of the high temperature furnace used have been described earlier by Ye. S. Lukin and D. N. Poluboyarinov (Ogneupory, 1963, No. 7, 318—323; 1964, No. 9, 418—424). It was established that the nature of the oxides and their melting points

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ACC NR. AT6036924

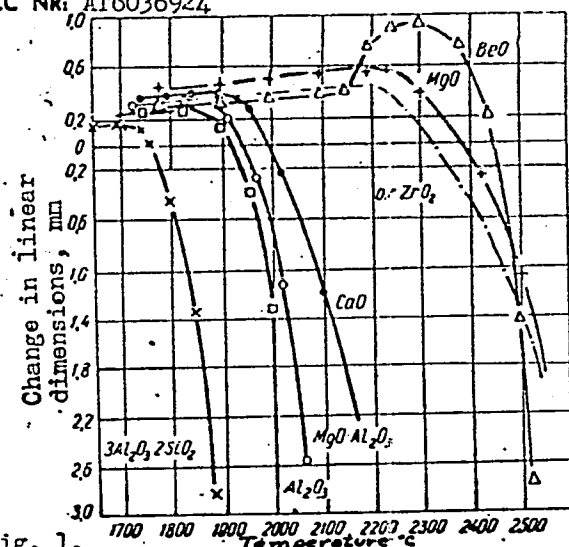


Fig. 1.
Deformation curves under load of 2 kg/cm^2 for sintered pure oxide ceramics

Card 2/3

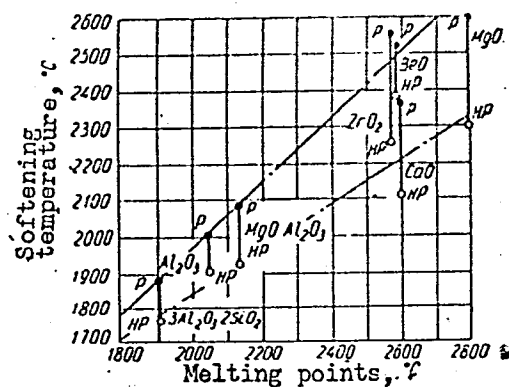


Fig. 2.

Deformation temperatures and melting points of oxide ceramics: HP - temperature at which softening starts; P - temperature of complete destruction. Softening temperatures for CaO are given for the specimens having relative density of 98%

ACC NR: AT6036924

determine the deformation of the ceramics, as can be seen in Figs. 1 and 2. Here, III, IVa and b, and V show the highest softening temperatures and greatest bending strength at temperatures $> 1500^{\circ}\text{C}$. Despite the good strength and refractory qualities of V, this material cannot be used for any length of time in vacuo due to its excessive loss of weight. IVa and b ceramics evaporate least of all at $> 2000^{\circ}\text{C}$, but have very poor thermal stability. Materials I and II are equally valuable for their refractory and mechanical properties at high temperatures. Orig. art. has: 7 tables and 7 figures.

SUB CODE: 11/ SUBM DATE: 02Nov65/ ORIG REF: 015/ OTH REF: 007

Card 3/3

ACC NR: AT6036926

SOURCE CODE: UR/0000/66/000/000/0040/0053

AUTHORS: Poluboyarinov, D. N.; Guzman, I. Ya.

ORG: nono

TITLE: Fundamentals of technology of porous refractory ceramics, its structure and properties

SOURCE: Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii. Moskovskoye pravleniye. Vysokoogneupornyye materialy (Highly refractory materials). Moscow, Izd-vo Metallurgiya, 1966, 40-53

TOPIC TAGS: porous foam ceramics, oxide ceramic, ceramic material, refractory product

ABSTRACT: Preparation of porous, highly refractory ceramic materials based on Al_2O_3 , BeO , ZrO_2 , MgO , SiO_2 , SiC , and $MgO \cdot 2Al_2O_3 \cdot SiO_2$ was studied. Structure and properties as well as the effect of various technological parameters upon the formation of these materials were investigated. To maintain the high purity of each oxide, the porosity was produced by either of two methods: 1) introduction and subsequent removal by roasting of low-ash organic compounds; 2) formation of gas bubbles in the wet phase by mechanical means. Petroleum coke with ash content $\sim 2\%$ was employed in the first case, and resin soap containing 1% of joiner's glue served to

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ACC NR: AT6036926

create a stable, fine foam with cells of 0.2--0.6 mm in the second case. A correlation was found between the structures of the produced porous ceramics and properties such as: volumetric mass, intrinsic porosity, coefficient of gaseous penetration, coefficient of thermal expansion, compressibility, number of thermal cycles, etc. Commercial and industrial applications of these materials are discussed. Orig. art. has: 4 tables.

SUB CODE: 11/ SUBM DATE: 02Nov65/ ORIG REF: 001

Card 2/2

ACC NR: AT6036931

SOURCE CODE: UR/0000/66/000/000/0092/0105

AUTHORS: Duderov, I. G.; Poluboyarinov, D. N.

ORG: none

TITLE: Heat conductivity of ceramics obtained from pure oxides

SOURCE: Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii. Moskovskoye pravleniye. Vysokoogneupornyye materialy (Highly refractory materials). Moscow, Izd-vo Metallurgiya, 1966, 92-105

TOPIC TAGS: ceramic material, heat conductivity, aluminum oxide, magnesium oxide, beryllium oxide, zirconium oxide

ABSTRACT: The heat conductivity of ceramic materials manufactured from pure Al_2O_3 , MgO , BeO , and ZrO_2 was determined. Two different methods for the determination of the coefficient of heat conductivity were employed; viz.: the stationary state method described by A. F. Kolehkhova and V. V. Goncharov (Ogneupory, 1948, No. 9, 401--407), and the thermally programmed method described by Yu. P. Barskiy (Metody i pribory dlya teplofizicheskikh izmereniy, Tezisy dokladov LITMO, 1961). The specific heat of the investigated materials was determined after the method of Z. Ye. Lobanova (Ogneupory, 1939, No. 1, 17--22). The experimental results are summarized in graphs and tables (see Fig. 1). It was found that the magnitude of the coefficient

Card 1/2

ACC NR: AT6036939

SOURCE CODE: UR/0000/66/000/000/0178/0202

AUTHORS: Polyak, B. I.; Polubryarinov, D. N.; Balkevich, V. L.

ORG: none

TITLE: Conditions for direct thermoelectric firing of silicon carbide heating elements

SOURCE: Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii. Moskovskoye pravleniye. Vysokoogneupornyye materialy (Highly refractory materials). Moscow, Izd-vo Metallurgiya, 1966, 178-202

TOPIC TAGS: silicon carbide, electric device, electric equipment

ABSTRACT: The conditions for direct thermoelectric firing of moist and plastic silicon carbide heating elements were studied. The study supplements the results of A. D. Svenchanskiy (Elektricheskiye promyshlennyye pechi. Ch. I, Gosenergoizdat, 1958). Properties of specimens made from five different initial mixtures were investigated. Four of the mixtures were prepared by a plastic compression technique, and the remaining one by a vibration technique. The optimum composition of specimens and the voltage and current during thermoelectric firing were determined. The results are tabulated. An x-ray and microstructural analysis of the specimens was carried out. The experimental results are shown graphically, and a schematic of the

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ACC NR: AT6036939

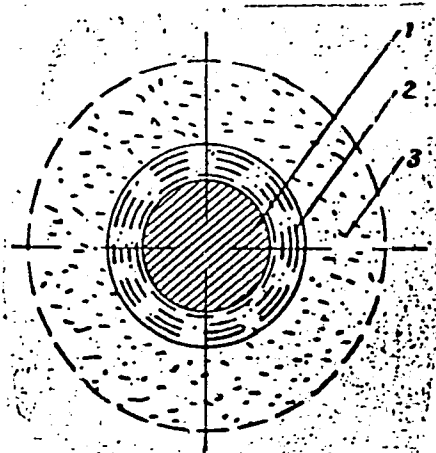


Fig. 1.
Schematic of cross section of firing zone. 1 - silicon carbide element; 2 - firing surplus; 3 - filler

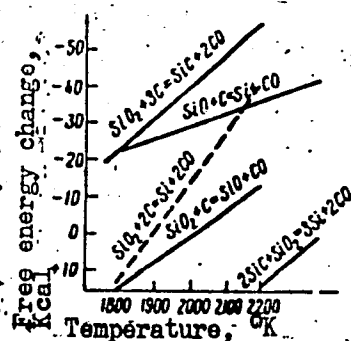


Fig. 2.
Free energy change for the system Si-O-C; dashed line: overall reaction

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ACC NR: AT6036939

specimen firing cross section is presented (see Fig. 1). The behavior of different fillers during firing was studied. The study was carried out after the method of V. P. Yelyutin, Yu. A. Pavlov, and B. Ye. Levin (Ferrosplavy, Metallurgizdat, 1951). The results are shown graphically (see Fig. 2). It was found that thermoelectric firing of silicon carbide elements yields a strong monolithic material. The composition of the completely fired material consists mainly of hexagonal silicon carbide, some cubic silicon carbide, and unreacted components. It is concluded that, to insure a high quality of product, the firing of each element must be individually controlled. Orig. art. has: 9 tables, 10 graphs, and 4 equations.

SUB CODE: 11,09 SUBM DATE: 02Nov65/ ORIG REF: 016/ OTH REF: 001

Card 3/3

ACC NR: AP7005512

(A)

SOURCE CODE: UR/0131/66/000/011/0033/0037

AUTHOR: Poluboyarinov, D. N.; Andrianov, N. T.; Guzman, I. Ya.; Lukin, Ye. S.

ORG: Moscow Chemico-Technological Institute im. D. I. Mendeleev (Moskovskiy khimiko-tekhnologicheskii institut)

TITLE: Evaporation of porous oxide ceramics at elevated temperatures

SOURCE: Ogneupory, no. 11, 1966, 33-37

TOPIC TAGS: oxide ceramic, porous foam, ceramic, refractory product, evaporation, porosity

ABSTRACT: The thermomechanical and thermophysical properties of refractory porous oxide ceramics have been previously investigated (Guzman, I. Ya. Zhurnal VKhO im. D. I. Mendeleeva, 1965, t. 10, no. 5, s. 571) but the suitability of these ceramics as heat insulating materials for equipment with a high vacuum or with a neutral gaseous medium is also limited by evaporation, on which no information has previously been available. To fill this gap, specimens of Al_2O_3 , ZrO_2 , BeO and MgO ceramics with typical values of porosity, prepared both by the foam method and by the method of burnout of additives, were tested for evaporation rate in

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UDC: 666.764

ACC NR: AP7005512

vacuum and in a helium atmosphere at 2073-2573°K by the method described by Lukin and Poluboyarinov (Ogneupory, 1964, no. 9, s. 418) for solid ceramics (since evaporation in porous bodies is difficult to determine, in this case conditional rate of evaporation, i.e. loss of weight per unit time per unit surface determined according to external dimensions of the specimen was used as the yardstick). Findings: given equal porosity, foam ceramics have a higher apparent porosity, a much lower gas permeability and smaller unit surface area than the ceramics prepared by the method of burnout of additives. The ratio K of effective surface area S_{eff} to total S_{total} , which also includes the surface area of isolated pores, represents the part of surface area of pores from which evaporation occurs: $K = S_{eff}/S_t$. In this connection, on the basis of the obtained findings and their comparison with data on the evaporation of solid sintered specimens, empirical equations are derived for calculating the evaporation of porous pure-oxide ceramics without resorting to intricate experiments. Thus the evaporation rate of a ceramic of any porosity can be determined from the relation $G = \Delta g/S_{eff}t$, where Δg is the weight loss of the specimen, g; S_{eff} is the effective surface area, cm^2 ; t is the time of evaporation, sec. The higher the porosity and hence also the higher S_{eff} is, the greater the weight loss Δg must be. A comparison of experimental and theoretical findings on specimens of

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ACC NR: AP7005512

varying porosity shows that K is constant for all types of ceramics and depends only on the method of their fabrication, which determines the nature of their structure. Orig. art. has: 2 figures, 3 tables.

SUB CODE: 11, 20/ SUBM DATE: none/ ORIG REF: 005

Card 3/3

ACC NR: AP7005311

SOURCE CODE: UR/0131/67/000/001/0039/0046

AUTHOR: Bakunov. V.S.; Poluboyarinov, D.N.

ORG: Moscow Chemical Technology Institute im. D.I. Mendeleev
(Moskovskiy khimiko-tekhnologicheskii institut)

TITLE: Creep of Al_2O_3 polycrystalline ceramics at high temperatures

SOURCE: Ogneupory, no. 1, 1967, 39-46

TOPIC TAGS: alumina, ceramics, ~~creeping~~, plastic deformation, refractory,
~~hot induced deformation~~, high temperature effect, ceramic material, ceramic product property

ABSTRACT: Creep of polycrystalline ceramics is characterized as thermally activated plastic deformation of crystals under stress. Experimental data on the creep of ceramics are needed to evaluate the structural properties of refractories which are intended for use at high temperatures under load. Published theories on the creep process are discussed to show that the experimental study of creep processes are needed to determine their mechanism of deformation and general characteristics. Creep was studied using polycrystalline ceramic specimens prepared from a technical alumina alone and with additions of MgO or TiO_2 . Composition, preparation conditions, and some characteristics of the ceramics are given in Tables 1 and 2. The experimental results are shown in Table 3.

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UDC: 666.76.001.5

ACC NR: AP7005311

Table 1. Properties and density of sintered ceramic based on Al_2O_3 .

Specimen index	Additive		Calcination		Indices of the sintered material	
	Form	%	Temperature, °C	Holding time, hr.	Apparent density (volume weight) g/cm ³	True porosity
A-1	—	—	1730	2	3,85	3,8
A-2	—	—	1730	16	3,99	1,8
A-3	—	—	1850	2	3,84	4,0
A-M	MgO	0,5	1730	2	3,90	2,5
A-T ₁	TiO ₂	1,0	1600	2	3,85	3,8
A-T ₂	TiO ₂	1,0	1700	1,5	3,86	3,6

Data on the rate of creep as a function of particle size, temperature, and applied load are presented graphically. At a constant temperature and constant load, the creep rate of alumina ceramics decreased with increasing calcination temperature and time. At stresses up to 25 kg/cm², the rate of deformation of alumina ceramics increased linearly

Card 2/ 5

ACC NR: AP7005311

Table 2. Characteristics of the specimens studied*

Specimen index	Size of particles, μm			Ultimate bending strength, kg/cm^2		Ultimate strength on bending at three points, at		Deformation temperature under load 2 kg/cm^2 , °C		
	Min- mum	Pre- walling	Maxi- mum	At three points	At four points	20°C	1600°C	Softening point	4% com- pression	10% com- pression
A-1	5	10	20	2200	1700	—	—	—	—	—
A-2	20	30	60	1550	1100	1520	170	1900	1960	2000
A-3	20	40	120	1300	900	—	—	—	—	—
A-M	<5	10	25	2700	1700	3000	200	1910	1960	2000
A-T ₁	12	30-40	120	1600	1100	1450	150	1860	1930	1960
A-T ₂	10	30	100	2100	1500	—	—	—	—	—

*Deformation temperatures under load and ultimate bending strength at 20 and 1600 C are taken from a paper by E. S. Lukin.

with the stress. The activation energy of the creep varied with the temperature of thermal treatment of the specimens; at maximum deformation temperature, the activation energy increased with increasing calcination temperature and time. At constant temperature and stress, the rate of deformation of alumina ceramics is inversely proportional to the particle

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ACC NR: AP7005311

Table 3. Creep rate of Al_2O_3

Specimen index	Stress kg/cm ²	Diffusion rate $\epsilon \times 10^3$, mm/(mm·hr) at temperatures, °C								
		1500	1550	1600	1650	1700	1750	1800	1850	1900
A-1	6	—	—	0,85	1,70	2,88	5,0	8,7	—	—
	13	—	—	1,14	4,36	7,25	14,0	28,8	—	—
	25	—	—	5,75	11,5	20,0	43,7	79,8	—	—
A-2	6	—	—	—	0,08	0,20	0,43	1,40	2,62	5,60
	13	—	—	—	0,18	0,48	1,00	3,40	5,90	15,8
	25	—	—	—	0,48	1,00	2,28	7,90	14,0	36,2
A-3	6	—	—	—	0,02	0,06	0,22	—	—	—
	13	—	—	—	0,04	0,12	0,42	—	—	—
	25	—	—	—	0,10	0,32	0,11	—	—	—
A-M	7	—	—	—	0,46	1,37	2,28	4,15	8,10	15,1
	15	—	—	—	1,84	5,50	8,33	15,1	25,5	69,0
	27	—	—	—	5,48	13,80	15,0	46,5	89,0	—
A-T ₁	7	2,1	3,5	4,7	6,05	—	—	—	—	—
	15	3,5	10,5	23,3	35,5	—	—	—	—	—
	27	12,5	39,8	100,0	141,0	—	—	—	—	—
A-T ₂	7	—	—	—	1,7	3,16	6,05	8,3	—	—
	15	—	—	—	3,16	6,20	11,2	16,2	—	—
	27	—	—	—	6,75	12,2	21,4	33,8	—	—

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ACC NR: AP7005311

size, which in turn depends on the calcination time and temperature. Small additions of MgO or TiO_2 to the technical alumina had no marked effect on the rate of creep and on its activation energy. Creep rate is determined mainly by the viscous diffusion of the substance. [PS]

SUB CODE: 1120/SUBM DATE: none/ ORIG REF: 016/ OTH REF: 007/
ATD PRESS: 5115

Card 5/5

POLOBOYARINOV, D.M., doktor tekhn. nauk, prof.; KONGLI, Yeh. Yeh.

Diffusion expansion of synthetic mullite materials. Izv.
NIISTroikeramki no.24:133-137 1964. (Sov. 1964)

L 53779-65 EWT(d)/EWP(e)/EPA(s)-2/EWT(m)/EWP(w)/EWP(i)/EPF(n)-2/ENG(m)/EWA(d)
EPR/EPA(w)-2/T/EWP(t)/EWP(b) Pab-10/Pa-4/Pt-7/Pu-4 IJP(c) JD/JG/EM/AT/WH

ACCESSION NR: AP5011933

UR/0363/65/001/003/0374/0379

AUTHOR: Poluboyarinov, D. N.; Bakunov, V. S.

TITLE: Investigation of high-temperature creep in ceramics prepared from pure
alumina and magnesia

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 374-379

TOPIC TAGS: nonmetal creep; ceramic product, alumina, magnesium compound,
high temperature effect

ABSTRACT: The present use of highly refractory ceramics in structural components working under load at elevated temperatures requires appropriate investigations of the behavior of ceramics under these working conditions. In comparison to the literature of other countries, the Soviet literature shows relatively little investigation of creep in ceramics. In the course of studies of bending deformation in ceramic samples, the authors constructed a device suitable for bending-deformation measurements at elevated temperatures.

The water-cooled base of the oven 13 carries molybdenum supports 11 which hold the sample. A load is applied to the sample from above by means of a molybdenum support 5 whose upper rod-shaped extension bears the

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L 53779-65

ACCESSION NR: AP5011933

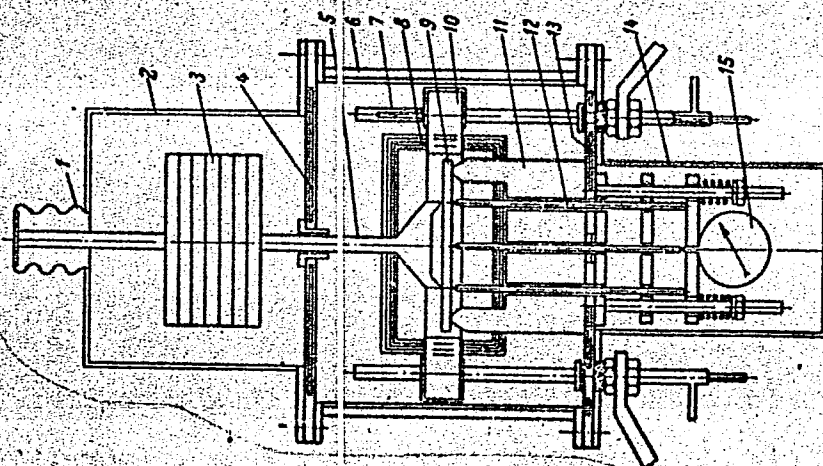


Fig. 1. Diagram of the oven used for creep determination.

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L 53779-65

ACCESSION NR: AP5011933

required weight 3. In the support the straight edges are connected to the rod by a swivel joint. Bellows 1 makes it possible to raise or lower the loading structure with an external screw. The loading mechanism is enclosed in the upper hood 2; it is separated from the water-cooled furnace body 6 by the water-cooled cover 4. The deformation of the sample is transmitted by ruby rods 12 to the indicator 15, which is contained in the lower hood 14. Molybdenum or tungsten foil 10 serves as the heater; the current is supplied to the heater by water-cooled leads 7. The heater is shielded by screens 9. The temperature is measured by an optical pyrometer. The pickup of the control unit is a tungsten-rhenium thermocouple connected to the outside. The signal from the thermocouple is sent to the programming and regulating device (PRP-5212). Any imbalance of the bridge of the PRP-5212 resulting from temperature deviations is transmitted through an IR-130-M regulator to an IM-2/120 actuator. The actuator then moves the winding of the autotransformer 8 in the proper direction. In the course of operation the oven can be evacuated to 10^{-2} mm, then filled with helium, and maintained at the assigned temperature, up to 2000° C.

Cord 3/4

L 53779-65

ACCESSION NR: AP5011933

Creep tests with alumina, magnesia, and spinel samples showed that these materials can work reliably at 1600—1700° C under loads of 6 kg/cm². At higher temperatures their service life is reduced to a few hours and less. The results obtained are very close to those given in the non-Soviet sources. Orig. art. has 3 figures, 2 tables, 2 graphs.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskii institut im. D. I. Mendeleyeva
(Moscow Chemico-Technological Institute)

SUBMITTED: 15Dec64

ENCL: 00

SUB CODE: MT, TD

NO REF SOV: 007

OTHER: 009

ATD PRESS: 4007-F

BB
Card 4/4

LEBEDEV, B.V., inzh.; POCHBOYARINOV, D.N., doktor tekhn. nauk; ZAYONTS,
R.M., kand. tekhn. nauk

Ways of eliminating the water permeability of clay sewer pipes.
Stek. i ker. 22 no.4:29-33 Ap '65. (MIRA 18:5)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut stroitel'noy
keramiki Gosstroya SSSR.

AKOPOV, F.A.; POLUBOYARINOV, D.N.

Some properties of fused ceramics from cerium dioxide.
Ogneupory 30 no.4:37-42 '65. (MIRA 18:6)

1. Moskovskiy khimiko-tehnologicheskii institut im. D.I.
Mendeleeva.

L 51077-65 EWG(j)/EWP(e)/EPA(s)-2/EWT(m)/EPF(c)/EWP(i)/EPR/EPA(w)-2/T/
EWP(t)/EWP(b) Pab-20/Pr-4/Pe-4/Pt-7 IJP(c) JD/JG/WH
ACCESSION NR: AP5010413 UR/0131/65/000/004/0037/0042

AUTHOR: Akopov, F.A.; Poluboyarinov, D.N.

TITLE: Some properties of sintered cerium dioxide ceramics

SOURCE: Ogneupory, no. 4, 1965, 37-42

TOPIC TAGS: cerium dioxide ceramic, sintered cerium dioxide, ceramic mechanical property, oxide sinterability

ABSTRACT: The sinterability of CeO_2 samples pressed at 500 kg/cm^2 was studied as a function of the degree of comminution of the material and of the firing temperature. A special furnace with a platinum-rhodium heater was constructed for the study of the sintering and for the determination of the deformation temperature of CeO_2 subjected to a load under oxidizing conditions. It was found that sintering of finely milled CeO_2 begins at 1000°C and takes place rapidly at $1300\text{--}1500^\circ\text{C}$, reaching completion after 1 hr. of soaking at 1500°C . The bending strength at normal and high temperatures, coefficient of thermal expansion, thermal stability, and temperature of deformation under load were determined in completely sintered samples. The reduction rate of CeO_2 was studied at $1200\text{--}1670^\circ\text{C}$ in helium and in a vacuum. After 9 hrs. of soaking in helium at

Card 1/2

L 51077-65

ACCESSION NR: AP50104:6

1670C, CeO_2 was reduced to a composition corresponding to $\text{CeO}_{1.70}$. In a vacuum, vaporization of CeO_2 begins at 1600C. Reduction of CeO_2 causes a decline in a number of its refractory and thermomechanical properties. Orig. art. has: 6 figures and 6 tables.

ASSOCIATION: Moskovskiy khimiko-tehnologicheskii institut im. D.I. Mendeleyeva
(Moscow Chemical Engineering Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT, MM

NO REF SOV: 007

OTHER: 005

Card 2/2

L 48568-65 EWG(j)/EPA(s)-2/EWP(e)/EWT(m)/EWP(w)/EPP(c)/EWP(i)/EWP(t)/EPP(n)-2/
EWA(d)/EPR/EPA(w)-2/T/EWP(b) Fab-10/Pr-4/Ps-4/Pt-7/Pu-4 IJP(c) JD/WH
UR/0081/65/000/004/M008/M008

ACCESSION NR: AR5009905

SOURCE: Ref. zh. Khimiya, Abs. 4M56

AUTHOR: Poluboyarinov, D. N.; Shal'nov, Ye. I.

TITLE: Some problems in hot pressing of pure oxides

CITED SOURCE: Tr. Mosk. khim.-tekhno. in-ta im. D. I. Mendeleeva, vyp. 45, 1964, 95-98

TOPIC TAGS: alumina, bending strength, density, vacuum annealing, hot pressing

TRANSLATION: The density and bending strength for hot pressed specimens of Al_2O_3 were compared with these same properties for samples annealed in a vacuum. A maximum strength of 6560 kg/cm² is developed during hot pressing for 30 min at 1700° under a pressure of 500 kg/cm². A strength of 3360 kg/cm² is attained during annealing in a vacuum up to 1800°, and a density of 3.97 g/cm³ is reached during annealing in a vacuum up to 1900°; materials should be used which have been cleaned in concentrated HCl with the addition of 0.4% MgO. Samples of Al_2O_3 with various purities and preliminary heat treatment have a density of 3.98 g/cm³ with hot

Card 1/2

L 48568-65

ACCESSION NR: AR5009905

pressing up to 1600-1700°.

SUB CODE: MT

ENCL: 00

Card 2/2

POLUBOYARINOV, D.N.

Contribution of science to industry. Ogneupory 29 no.11:427-488 1964.
(MIRA 18:1)

1. Moskovskiy khimiko-tekhnologicheskii institut im. D.I.Mendeleyeva.

L 6878-65 EWG(j)/EPA(s)-2/EWT(m)/EPF(o)/EPF(n)-2/EPR/EPA(w)-2/T-2/EWP(q)/
EWP(b) Pab-24/Pr-4/Ps-4/Pt-4/G/Pu-4 ASD(m)-3/BSA/AFTG(p) JD/WH/JG/WH
ACCESSION NR: AR4041669 S/0081/64/000/007/M004/M005

SOURCE: Ref. zh. Khimiya, Abs. 7M30

164
102

AUTHOR: Vlasov, A. S.; Poluboyarinov, D. N.

TITLE: Influence of temperature and gas medium on character of sintering and durability of $\text{Cr+Al}_2\text{O}_3$ cermet

CITED SOURCE: Tr. Mosk. khim.-tekhnol. in-ta im. D. I. Mendeleyeva, vy*p. 41, 1963, 158-163

TOPIC TAGS: cermet, sintering, durability, sintered alloy

TRANSLATION: Optimum conditions for firing of $\text{Cr+Al}_2\text{O}_3$ cermet synthesized by thermite method were investigated and influence of maximum firing temperature, its duration, and gas medium in which firing was conducted, on evaporation of metal and on bending strength were determined. Research was conducted on two forms of $\text{Cr+Al}_2\text{O}_3$ cermets with identical chromium content, prepared by different methods. Cermet K-0 (control) was prepared by usual ceramic technology from metallic powders of

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L 6878-65

ACCESSION N^o: AR4041669

chromium and alumina. Cermet K-1 was prepared by synthesis by thermite reaction (temperature $>1,800^{\circ}$) from Cr_2O_3 and metallic Al. Sintering of cermets was conducted at temperatures of $1,100 - 1,800^{\circ}$. It was established that as temperatures and duration of firing increase, the quantity of evaporated chromium increases; this lowers bending strength. Therefore, firing of cermet K-0 in vacuum should be conducted at maximum temperatures with short exposure ≤ 30 min. As chromium content in cermet increases, its speed of evaporation increases. For cermet K-1 the speed of evaporation is less than for cermet K-0; therefore temperature and duration of firing have less influence on its bending strength. Transition from vacuum to medium of inert gas lowers loss of chromium. Firing at atmospheric pressure at temperatures greater than $1,820^{\circ}$ evokes distending of metal and influx on surface of sample from expansion of gas in the pores. The formation of a chromium oxide film on metal granules substantially affects strength of K-0 cermet, increasing its bending strength by $\sim 30\%$. From authors' summary.

Card 2/2

L 6880-65 EWG(j)/EPA(s)-2/WT(m)/EPF(c)/EPF(n)-2/EPH/EPA(w)-2/T/EWP(q)/
EWP(b)/EWA(h) Pab-24/Pr-4/Pi-4/Pt-10/Peb/Pu-4 RAEM(t) JD/WH

ACCESSION NR: AR4041670

S/0081/64/000/007/M007/M007

SOURCE: Ref. zh. Khimiya, Abs. 7M45

104

AUTHOR: Duderov, I. G.; Poluboyarinov, D. N.; Rakhmanov, V. A.

15

TITLE: Thermal conduction of porous materials of zirconium dioxide and its dependence on porosity and character of structure

CITED SOURCE: Tr. Mosk. khim.-tekhkol. in-ta im. D. I. Mendeleeva, vy*p. 41, 1963, 164-172

TOPIC TAGS: zirconium dioxide, porosity, thermal conductivity

27

TRANSLATION: Thermal conduction of dense articles of ZrO_2 (6 - 13% porosity) is 1.10 - 1.20 kilocalorie/m · hour · degree and practically is not changed within limits of 300 - 1,000°. Increase of porosity of foam samples to 80 - 83% is accompanied by decrease of thermal conduction to 0.30 - 0.23 kilocalorie/m · hour · degree (temperature of 1,000°). Simultaneously during transition from 200 to 1,000° thermal conduction is increased by 20 - 50%. Repeated determination of thermal conduction of foam samples is accompanied by decrease of thermal conduction by 10 - 15%; this is connected with appearance of cracks and flaws during sharp

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L 6880-65

ACCESSION NR: AR4041670

heating and cooling of tested samples. Thermal conduction of porous articles, obtained with burning additives, is less than that for foam samples with the same porosity.

SUB CODE: IC, TD

ENCL: 00

Card 2/2

L 17634-65 EWP(e)/EPA(s)-2/EPF(c)/FCS/EPF(n)-2/EWG(v)/EPR/EPA(w)-2/
 EWP(j)/T/EWP(t)/EPA(bb)-2/EWP(b)/EWA(h)/EWA(l) Pc-4/Pe-5/Pq-4/Pab-10/Pr-4/Ps-4/
 Pt-10/Peb/Pu-4 IJP(c)/ASD(m)-3/AS(mp)-2/AFETR JD/WH/JH/JG/RM/WH
 ACCESSION NR: AF4045416 S/0131/64/000/009/0418/0424

AUTHOR: Lukin, Ye. S.; Poluboyarinov, D. N.

TITLE: Vaporization of pure oxide ceramics at high temperatures ¹⁵

SOURCE: Ogneupory*, no. 9, 1964, 418-424 ²⁷

TOPIC TAGS: ceramic, oxide ceramic, high temperature refractory
 oxide, magnesia, alumina, beryllia, calcium oxide, stabilized zirc-
 onia, spinel, mullite, oxide ceramic vaporization

²⁷ ABSTRACT: Utilization of pure oxide ceramics at high temperatures ¹⁵
 in inert atmosphere or in high vacuum is often accompanied by a loss
 of weight. Weight loss and vaporization rate of certain pure oxide
 ceramic materials have been determined at various temperatures up to
 2300C in a 10^{-4} mm Hg vacuum or in helium at 0.2 atm to ascertain
 the behavior of the materials under practical working conditions.
 The materials studied were MgO, Al_2O_3 , BeO, CaO, high-purity ZrO_2
 stabilized with 10 mol% of MgO or CaO, spinel ($MgO \cdot Al_2O_3$), and mul-
 lite ($3Al_2O_3 \cdot 2SiO_2$). No adequate study of these materials had been

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L 17634-65

ACCESSION NR: AP4045416

made. Conventionally prepared samples were suspended from a calibrated quartz spring balance inside a high-temperature vacuum furnace, which is described and shown schematically. The rate of weight loss was determined by continuous weighing during vaporization; the total loss of weight, as the difference in weight before and after the experiment. Basically, this is the Langmuir method of vaporization from a free surface in vacuum. The rate of vaporization data for all oxide ceramics studied were presented in a table and plotted versus temperature. Differences were noted between various oxides, depending on operating conditions. The rate of vaporization of all oxides was lower in helium than in vacuum. The highest rate was found for pure MgO ceramics under any conditions. Addition of 4% Al_2O_3 considerably decreased vaporization of MgO. The rate of vaporization increased for all oxides, especially for MgO and BeO, when temperature was increased. The rate of vaporization of CaO stabilized ZrO_2 was somewhat higher than that of MgO stabilized ZrO_2 . The changes in porosity and density of some oxide samples were noted after experiments in vacuum. Porous Al_2O_3 , ZrO_2 , BeO, and MgO samples were vaporized in vacuum 1.5--2 times faster than corresponding dense

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L 17634-65

ACCESSION NR: AP4045416

samples. A metal was deposited on MgO and, especially, CaO samples in contact with molybdenum or tungsten wire at high temperatures. The differences in vaporization patterns of various oxides are correlated with the structure and energy of their crystal lattices and, therefore, with the interatomic or interionic bond energy. Orig. art. has: 5 tables, 4 figures, and 1 formula. 18

ASSOCIATION: Khimiko-tekhnologicheskii institut im. D. I. Mendeleeva (Chemicotechnological Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 003

OTHER: 004

Card 3/3

BILYK, G.I.[Bilyk, H.I.]; POLUBOYARINOV, I.I.[Poluboiarynov, I.I.];
SHELYAG-SOSONKO, Yu.R.[Sheliah-Sosonko, IU.R.]

In memory of Volodymyr Oleksiiovych Povarnitsyn. Ukr. bot.
zhur. 20 no.2:110-114 '63. (MIRA 16:6)

(Povarnitsyn, Volodymyr Oleksiiovych, 1899-1962)

POLUBOYARINOV, I.I. [Poluboiarynov, I.I.]

V.O.Povarnitsyn's 60th birthday. Ukr.bot.zhur. 17 no.3:
85-86 '60. (MIRA 13:7)
(Povarnitsyn, Vladimir Alekseevich, 1899-)

DOBRYNIN, V.P., prof.; OL'SHANSKIY, M.A., akademik, lektor; YELIN, Ye.Ya., dots.; FAT'YANOV, A.S., prof.; GUBAREV, A.N.; TKACHENKO, P.I., dots.; CHIZHEVSKIY, M.G., prof., lektor; AVDONIN, N.S., prof., lektor; ONUCHAK, A.I., dots.; DUNIN, M.S., prof., lektor; SAVZDARG, E.E., prof., lektor; KREMENTETSKIY, N.D., dots., lektor; AVER'YANOV, S.F., dots., lektor; POLUBOYARINOV, I.I., dots.; GUBAREV, A.N., red. izd-va; NAUMOV, K.M., tekhn. red.

[Textbook on agriculture for party schools] Uchebnoe posobie po sel'skomu khoziaistvu dlia partiinykh shkol. Moskva. Pt.1. [Crop farming] Zemledelie. 1958. 397 p. (MIRA 15:1)

1. Kommunisticheskaya partiya Sovetskogo Soyuza. Vysshaya partiynaya shkola. 2. Vysshaya partiynaya shkola pri TSentral'nom komitete Kommunisticheskoy partii Sovetskogo Soyuza (for Dobrynin, Ol'shanskiy, Gubarev, Tkachenko, Chizhevskiy, Avdonin, Onuchak, Dunin, Savzdarg, Kremenetskiy, Aver'yanov). 3. Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk im. V.I.Lenina (for Ol'shanskiy). 4. Vysshaya partiynaya shkola pri TSentral'nom komitete Kommunisticheskoy partii Ukrainy (for Yelin, Poluboyarinov). 5. Gor'kovskaya Vysshaya partiynaya shkola (for Fat'yanov).
(Agriculture)

POLUBOYARINOV, I.I.

To the memory of Vladimir Alekseevich Povarnitsyn, 1899-1962. Bot.zhur.
49 no.10:1517-1520 0 '64. (MIRA 18:1)

1. Ukrainskaya Sel'skokhozyaystvennaya akademiya, Kiyev.

GUSEV, Valentin Ivanovich, prof., lesnoy entomolog; RIMSKIY-KORSAKOV, Mikhail Nikolayevich, prof., lesnoy entomolog [1873-1951]; YATSENTKOVSKIY, Aleksey Vladimirovich; SHIPELOVICH, Vladimir Yakovlevich, lesnoy entomolog; POLUBOYARINOV, Ivan Ivanovich, lesnoy entomolog; IL'INSKIY, A.I., dots., retsenzent; POLOZHENISEV, P.A., prof., retsenzent; KHRAMTSOV, N.N., red.; ARNOL'DOVA, K.S., red. izd-va; BACHURINA, A.M., tekhn. red.

[Forest entomology] Lesnaya entomologiya. Izd. 4., perer. pod obshchim rukovodstvom i red. V.I. Guseva. Moskva, Goslesbumizdat, 1961. 486 p. (MIRA 14:7)

1. Zaveduyushchiy kafedroy entomologii Ukrainskoy akademii sel'skokhozyaystvennykh nauk (for Gusev)
(Forest insects)

I 00570-66 EWP(m)/EWT(1)/T IJF(c)

ACCESSION NR: AP5016557

UR0056/65/048/006/1625/1636

AUTHORS: Ogiyevetskiy, V. I.; Polubarinov, I. V. 44, 55

34
32
B

TITLE: Spinors in gravitation theory 44, 55

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 6, 1965, 1625-1636

TOPIC TAGS: spinor, gravitation, fermion, graviton

ABSTRACT: Inasmuch as gravitational interactions of fermions have not yet been discussed within the framework of the perturbation-theory expansion in the gravitational constant, the authors employ a group-theoretical approach and introduce spinors as objects which transform in accordance with a representation of that group according to which the fundamental tensors are transformed. The gravitational interaction of fermions is thus expressed explicitly in terms of the gravitational field and can be represented in the form of an

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L 00570-66

ACCESSION NR: AP5016557

3

infinite series in terms of the gravitational coupling constant. The interaction obtained in this manner makes it possible in principle to calculate gravitational effects involving fermions to any arbitrary order in the gravitational coupling constant. The research was motivated by the fact that the weak-field approximation is insufficient even for such simple effects as the gravitational self-energy of the electron or the Compton effect of a graviton on a fermion, and it is necessary to take into account interaction terms of the second order in the gravitational coupling constant. The authors discuss the group property of generally covariant transformations, the laws of transformation of the spinor, the covariant derivative of a spinor, the properties of bilinear combinations, and the interactions of a spinor field. Interactions of a spinor field with gravitational, electromagnetic, and other fields are constructed in accordance with the derived transformation law. "The authors thank M. A. Markov for a discussion." Orig. art. has: 54 formulas.

44.55

Card 2/3

I. 00570-66

ACCESSION NR: AP5016557

SUBMITTED: 03Dec64

ENCL: 00

SUB CODE: GP, MA

NR REF SOV: 004

OTHER: 025


Card 3/3

POLUBOYARINOV, M. A., polkovnik meditsinskoy sluzhby; PUSTOVOYTENKO,
V. T., starshiy leytenant meditsinskoy sluzhby

Value of the thrombocytic formula in the diagnosis of cancer.
Voen.-med. zhur. no.12:69 D '61. (MIRA 15:7)

(BLOOD PLATELETS) (CANCER)

POLUBOYARINOV, M. A., (Colonel of the Medical Service) and PUSTOVOYTENKO, V. T.,
(First Lieutenant of the Medical Service)

"The Value of the Platelet Formula in the Diagnosis of Malignant Diseases"

Voyenno-Meditsinskiv Zhurnal, No. 12, December 1961, pp 62-73

ACHARKAN, V.A.; BARSKOV, I.M.; BIRYUKOV, I.S.; BORODINA, L.Ya.; BRENNER, M.M.;
 GORELIK, B.Ye.; GUMEROV, M.N.; ZORKAYA, N.M.; IOYNTSE, A.I.;
 KAYDALOVA, O.N.; KAPUSTIN, Ye.I.; LEBEJEVA, M.A.; LESHKOVTSY, V.A.;
 LYSSENKO, V.P.; MARKIN, A.B.; MIKHAYLOV, N.N.; NEST'YEV, I.V.; NECHAYEV,
 N.V.; NIKOL'SKIY, A.V.; OSTROUKHOV, M.Ya.; PISARZHEVSKIY, O.N.;
 POLUBOYARINOV, M.M.; POPOV, Yu.N.; PRASOLOV, M.A.; POKATAYEV, Yu.N.;
 RIMBERG, A.M.; RYABOV, V.S.; SEMKOV, B.F.; SPERANSKAYA, Ye.A.; TAKOYEV,
 K.F.; TRIFONOVA, G.K.; TROFIMOVA, V.I.; SHAKHNAZAROV, G.Kh.; SHKAREN-
 KOVA, G.P.; SHMENLING, K.G.; EYDEL'MAN, B.I.; MIKHELYAN, E.A., red.;
 MUKHIN, Yu.A., tekhn.red.

[U.S.S.R. as it is; a popular illustrated handbook] SSSR kak on est';
 popularnyi illiustrirovannyi spravochnik. Moskva, Gos.izd-vo polit.
 lit-ry, 1959. 452 p. (MIRA 12:2)

(Russia)

POLUBOYARINOV, O.I.; PLOTNIKOVA, G.P.

Improving the properties of wood affected by rotting. Der.prom.
11 no.12:8-9 D '62. (MIRA 16:1)

1. Lesotekhnicheskaya akademiya im. Kirova (for Poluboyarinov).
2. Tsentral'nyy nauchno-issledovatel'skiy institut fanery i mebeli
(for Plotnikova).

(Wood--Preservation)

ACB

Investigation of refractory materials. T. N. POLUBNOY.
YARIMON. *Izvestiya Akad. Nauk SSSR, Khim. Tekh. Tsel. Mater.*, 1940, No. 8, pp. 85-89; *Khim. Refrat. Zhur.*, 4 [7-8] 94-95 (1941).—The following investigations in ceramic technology at the Moscow Chemical-Technological Institute are briefly discussed: (1) frost resistance of grog refractories, (2) methods for determining the abrasion of refractory material, (3) a dynamic method for determining the glass resistance of refractories, (4) method for determining gas permeability, (5) destructive effect of the Bels reaction, (6) slag corrosion of grog products, (7) increasing the slag resistance of refractories, and (8) the pyrochemical activity of fuel slags. M.Ho.

SOV/123-59-15-59810

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 15, p 129 (USSR)

AUTHOR: Poluboyarinov, V.I.

TITLE: Methods of Outside Cleaning of Convective Heating Surfaces

PERIODICAL: V sb.: Kotel'no-vspomogat. oborud. elektr. st. M., 1957, pp 289 - 304

ABSTRACT: The article has not been reviewed.

Card 1/1

FOMIN, B. S., POLUBOYARINOV, V. I. and LUZHN OV, G. I. (Engr.)

POLUBOYARINOV, V. I.

"Removal of Ash and Slag Deposits."

A Scientific-Technical Conference on Auxiliary Equipment for Power Stations
Boiler Houses. Moscow, 17 - 20 Dec 1957.

Teploenergitika, 1958, No. 4, pp. 90-91 (USSR)

POLUBOYARINOV, V. V. (Head Veterinary Doctor, Krasnoturansk District Veterinary Hospital, Krasnoyarsk Territory). (Abstracted by NOSKOV, A. I.)

"Polychlorpinene in treating herpes tonsurans".....
Veterinariya, vol. 39, no. 3, March 1962 pp. 28

POLUBOYARINOVA, A.G. [Poluboiarynova, A.H.]

Use of synanthrin C as a blood stabilizer and transfusion of
synanthrinized blood into patients with an inclination to thrombosis.
Fiziol. zhur. [Ukr.] 7 no.5:690-695 S-0 '61. (MIRA 14:9)

1. Kiev Institute for Blood Transfusion.
(ANTICOAGULANTS (MEDICINE)) (SYNANTROL 20)

POLUBOYARINOVA, A.G. [Poluboiarynova, A.H.]

Preservation of blood with anticoagulating substances and its
experimental and clinical evaluation. Fiziol. zhur. [Ukr.]
9 no.4:538-540 J1-Ag '64. (MIRA 17:10)

1. Kiyevskiy nauchno-issledovatel'skiy institut perelivaniya
krovi.

L 26752-66 EWT(m)/T/EWP(t) JJP(o) JD

ACC NR: AP6011482

SOURCE CODE: UR/0070/66/011/002/0352/0354

AUTHOR: Bovina, L. A.; Vinogradova, V. G.; Poluboyarinnova, M. F.; Smirnova, Ye. A.; Kharakhorn, F. F.

ORG: none

TITLE: Sectorial structure of single crystals of indium antimonide doped with germanium

SOURCE: Kristallografiya, v. 11, no. 2, 1966, 352-354

TOPIC TAGS: indium compound, antimonide, electric conductivity, thermal emf, crystal structure, single crystal, semiconductor conductivity, crystal growth

ABSTRACT: The authors investigated the transverse inhomogeneity in the conductivity in single crystals of indium antimonide doped with germanium to an excess-acceptor density 10^{12} -- 10^{14} cm⁻³. The crystals were grown by the Czochralski method in the [111] and [211] directions at an inert gas pressure of 600 mm Hg. The conductivity inhomogeneity was determined from the sign of the thermal emf measured at liquid-nitrogen temperature. Most crystals grown in the [111] direction had n-type regions in the center and most frequently in the uppermost section of the crystal. With increasing crystal length, the entire section assumes a p-type conductivity and only a narrow ring of n-type (0.1--0.2 mm) appears on the edges of the plates cut from the crystal. In the [211] direction only peripheral n-type regions are produced. The results are attributed to the bending of the crystallization front and to varia-

Card 1/2

UDC: 548.52

L 26752-66

ACC NR: AP6011482

tion of the ratio of the effective donors through the volume of the crystal. It is therefore concluded that the inhomogeneities in the conductivity type in the transverse direction of weakly doped single crystals are due to residual donor impurities. Orig. art. has: 3 figures and 1 formula.

SUB CODE: 20/ SUBM DATE: 07-Jan65/ ORIG REF: 001/ OTH REF: 002

Card 2/2 *fy*

L 18053-66 EWT(1)/EWT(m)/1/EXP(t) IJP(c) JD

ACC NR: AP6003361

SOURCE CODE: UR/0363/66/002/001/0032/0035

AUTHOR: Kharakhonin, F. F.; Poluboyarinova, M. F.; Vinogradova, V. G.

ORG: none

TITLE: Effect of certain factors on the process of change of the conductivity sign during thermal treatment of n-InSb

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 1, 1966, 32-36

TOPIC TAGS: electric conductivity, indium compound, antimonide, metal diffusion

ABSTRACT: The study was made in order to determine the effect of thermal treatment under various conditions on the properties of n-type indium antimonide. Under suitable conditions of treatment (temperature, annealing time) in quartz ampoules (in a vacuum, in helium, krypton, and antimony vapor), the n-InSb samples with carrier concentrations of 10^{13} - 10^{14} cm⁻³ change their conductivity to hole conductivity over their entire volume while keeping approximately the same carrier concentration. The complex process of n-p transformation of InSb is thought to be due to the simultaneous and probably mutual influence of three factors, of which the

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predominant one is the migration of rapidly diffusing acceptor impurities over the surface and volume, the two others being the exodiffusion of antimony giving rise to acceptor levels in the sample, and the exodiffusion of indium. From the rate of displacement of the front of sign change, the limits of the diffusion coefficients of acceptor impurities were found to be $2.5\text{--}7.0 \times 10^5$. On the basis of these values, it is concluded that copper is the main impurity responsible for the process of conductivity sign inversion in indium antimonide. Orig. art. has: 3 figures and 2 tables.

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